

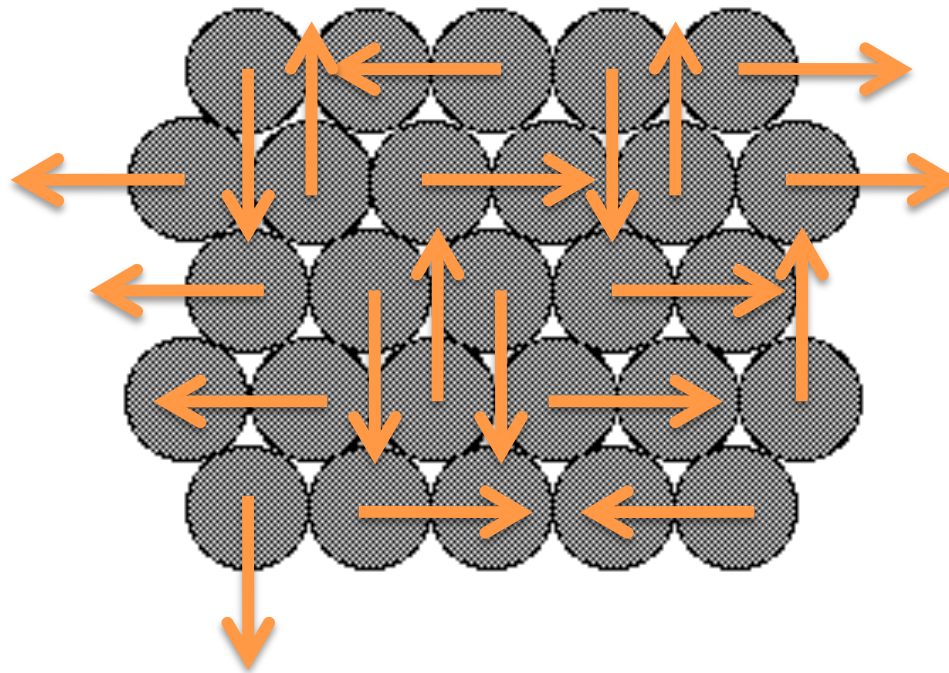
PHASE CHANGE

Physical Science

THE NATURE OF MATTER

1.A. Solids

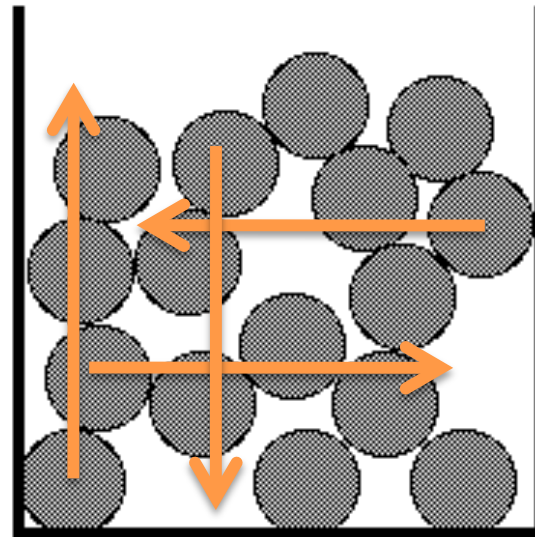
1. definite shape & volume
2. Particles held tightly together, and vibrate in place



THE NATURE OF MATTER

1.B. Liquids

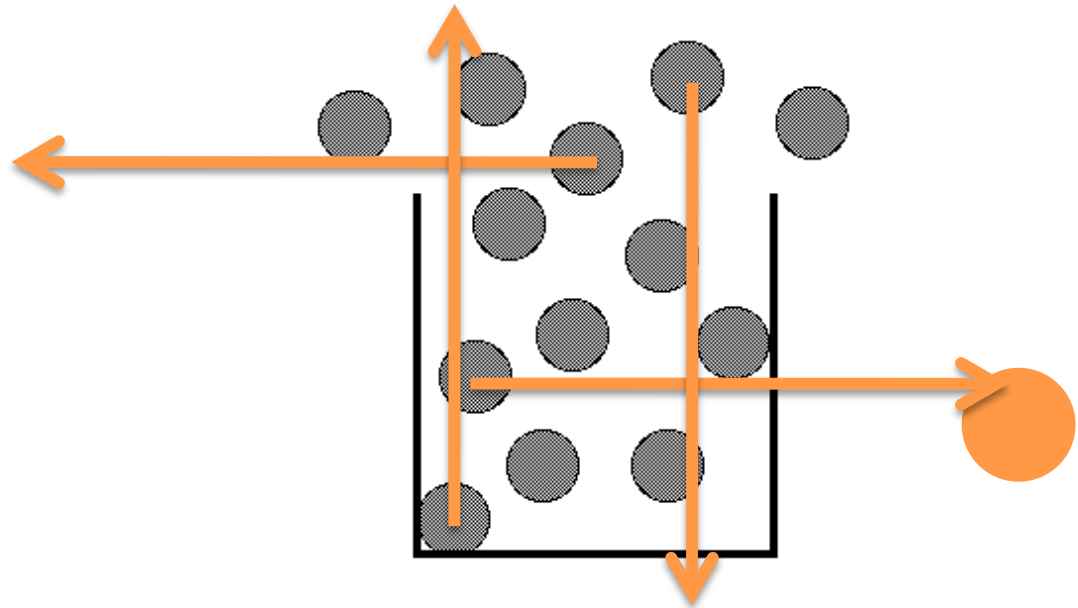
1. Changing shape, definite volume
2. Particles move rapidly, allows them to overcome attractive forces between them



THE NATURE OF MATTER

1.C. Gases

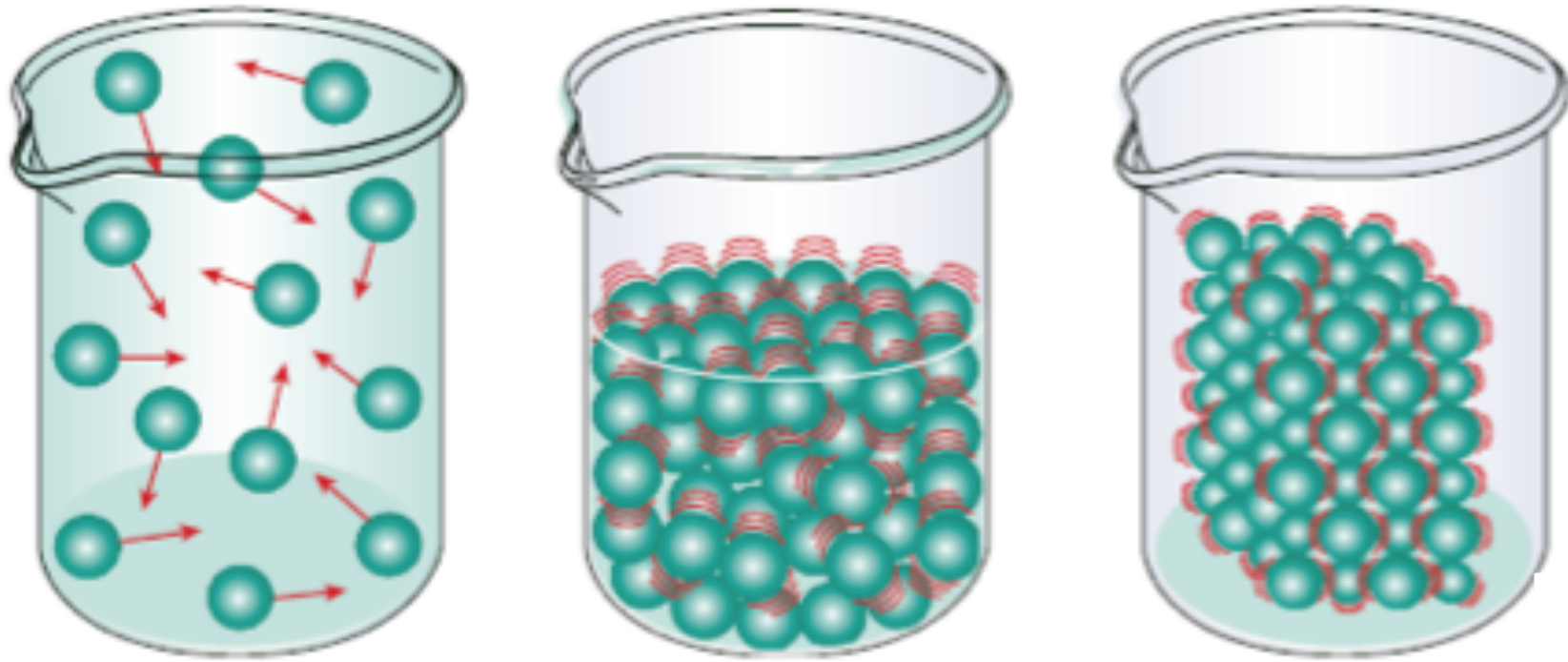
1. Changing shape and volume
2. Particles move fast and break away from each other. Amount of space b/t particles changes and gas expands to fill the space



PLASMA

- Plasma is the fourth state of matter. Many places teach that there are three states of matter; solid, liquid and gas, but there are actually four. The fourth is plasma. To put it very simply, a plasma is an ionized gas
- Example – lightening and neon signs





Low HEAT/ENERGY → → → → → → → HIGH HEAT/ENERGY

Forces holding molecules together!

WEAKER

→ → → → → → →

STRONGER



THE NATURE OF MATTER

3. Energy and Changes of State

Identity of a substance does not change during a change of state, but energy does

1. If you add energy, particles move faster
2. If you remove energy, particles slow down



THE NATURE OF MATTER

3.A. Melting

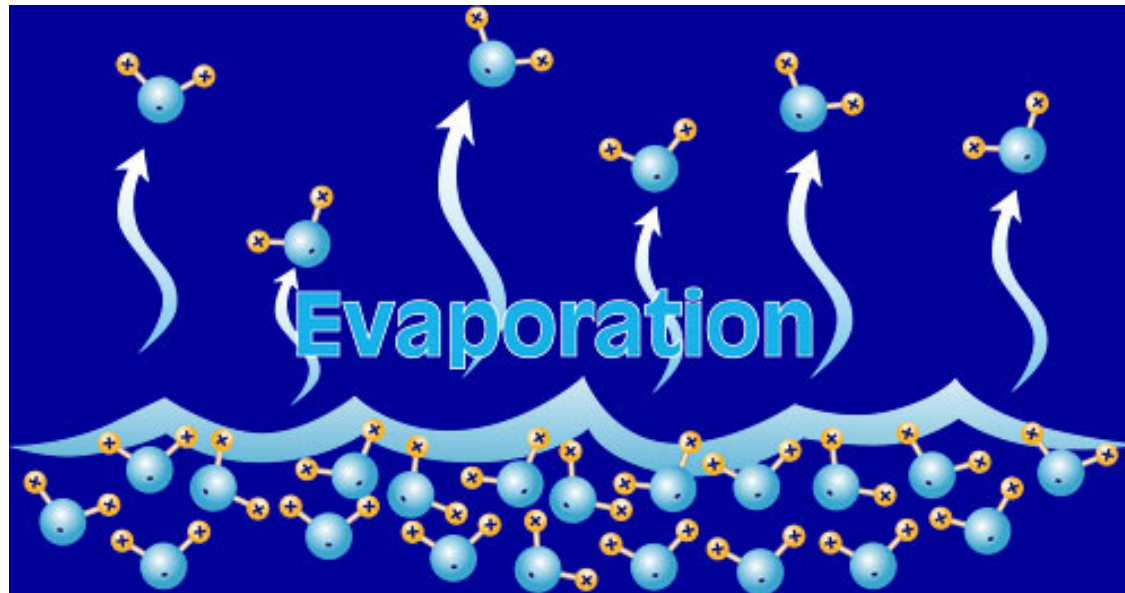
1. Heat transfers energy to the particles, which vibrate faster as they gain energy
 - a. Eventually they break free from their fixed positions and the solid melts
2. Melting point – temperature which substances change from solid to liquid



THE NATURE OF MATTER

3.B. Evaporation

1. Change from a liquid to a gas
2. Boiling point – temperature which a liquid turns to gas



THE NATURE OF MATTER

3.C. Sublimation

1. Solid changes directly into a gas



*Melting, Evaporation, and Sublimation all **require** energy

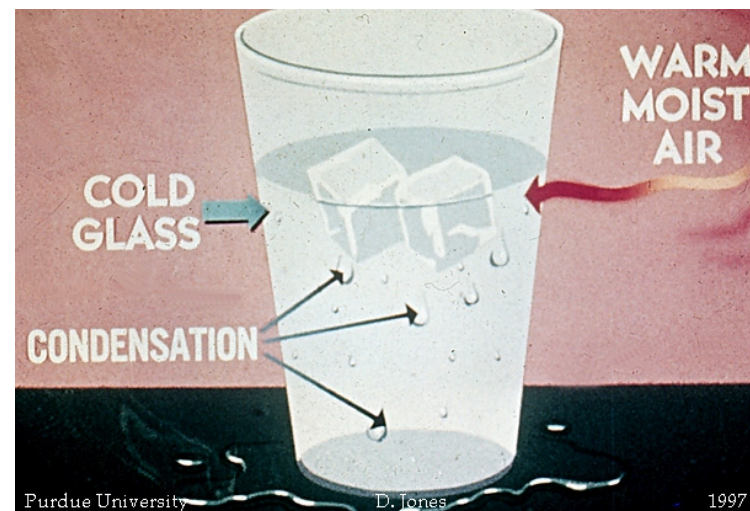
This means these processes are **ENDOTHERMIC**



THE NATURE OF MATTER

3.D. Condensation

1. Change from a gas to a liquid
 - a. energy is released, and the particles slow down
2. Condensation point – temperature at which a gas becomes a liquid



THE NATURE OF MATTER

3.E. Freezing

1. Change of state from a liquid to a solid
2. Freezing point – temperature which liquid changes into a solid
 - a. Melting point / freezing point occur at the same temperature



THE NATURE OF MATTER

3.F. Deposition

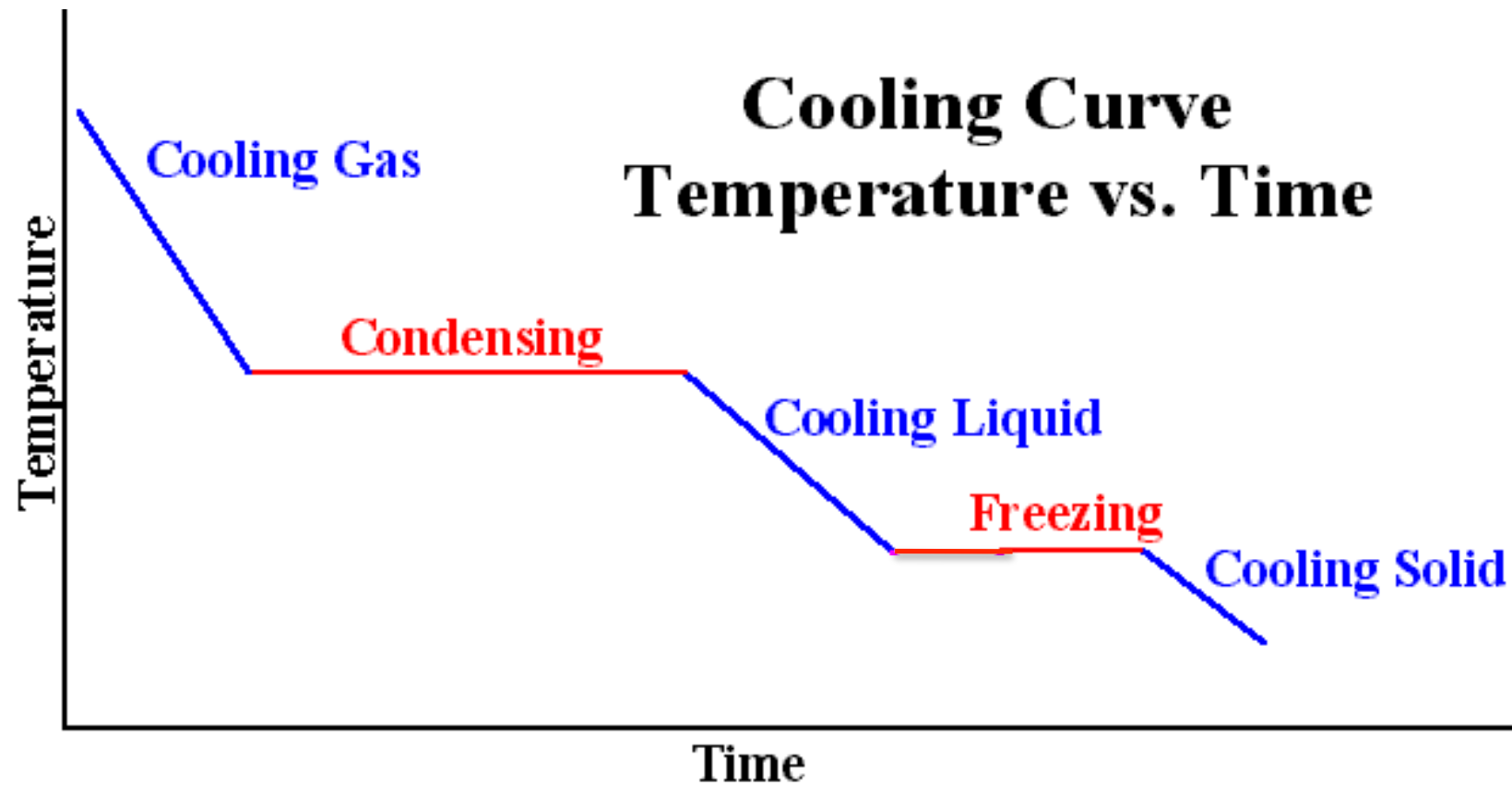
1. Changing from a Gas to a Solid



- Energy is **released** in condensation and freezing
-
- This means these processes are EXOTHERMIC



Cooling Curve Temperature vs. Time



CHANGES OF STATE

★ Temperature of a substance does not change during a change of state

★ When energy is lost or gained, either its temperature changes, or its state changes



